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Civil Engineers' Convention Considers Problems

By EDWARD M. SEVCIK, '30

One of the largest and most successful conventions in their history was held by the American Society of Civil Engineers in Columbus, on October 12, 13, 14, 15. About 600 engineers registered for the meeting. This is twice the usual number at any meeting except the annual one held in New York City.

The Mississippi River flood control problem was probably the largest single factor in attracting engineers from all over the country.

Among those present were, Secretary of War Dwight F. Davis, John F. Stevens, President of the Society; Major-General Edgar Godwin, Chief of Engineers, U. S. A., and a host of others who have acquired national reputations as engineers.

Seldom has any meeting of the society spent as much time on any one subject as was given to the problem of flood control on the Mississippi River. Other subjects, however, were not neglected. At the first technical session on Wednesday morning, October 12, the O'Shaughnessy dam and reservoir and the softening of the Columbus water supply were discussed. On Wednesday afternoon a general review of what had been done to control the Mississippi River was carried on into the evening when Secretary of War Davis told of the government's attitude. The discussion of this problem continued through Thursday. The structural, highway, and sanitary engineering division meetings were also held on Thursday. Friday was taken up by an all-day excursion to water purification works and dams and reservoirs of the Columbus water system. On Saturday the engineers visited The Ohio State University.

At the opening technical session Wednesday, John H. Gregory, professor of Civil Engineering at the John Hopkins University, Baltimore, Md., presented a paper on "The O'Shaughnessy Dam and Reservoir." This paper had been prepared by C. B. Hoover, superintendent of the water and sewage disposal divisions of Columbus; C. B. Cornell, field engineer of the Mahoning Valley Sanitary District, Youngstown, Ohio, and Professor Gregory. Charles Hoover, chemist in charge of the water softening and purification works, Columbus, Ohio, spoke on "Water Purification and Softening of the Columbus Water Supply."

In the structural division new observations and theories in the field of bridges, general structures, and tall buildings were presented. "Observed Effects of Climate Changes Upon a Multiple-Span Concrete Arch and Their Influence Upon Design" was presented by W. M. Wilson, Reserve Professor of Structural Engineering, University of Illinois. It dealt with the effects of temperature in a six-span concrete arch bridge. Measurements had been carried on over several seasons during a period of 20 months. The bridge has unequal spans, each composed of two hingeless ribs carrying a deck slab by means of spandrel columns. Expansion joints cut the deck at the

piers and also at the ends of the saddle formed on the three middle panels where the deck construction is integral with the rib concrete.

The mean temperature of the arch ribs varied over 90 degrees F. The maximum movement of the expansion joints was 5.37 inches, which was in agreement with the calculations. The temperature thrusts caused slight pier rotations, and neither these thrusts nor the dead load thrusts gave truly central pier footing reactions. The expansion joints at the ends of the saddles did not move, and in theory they should not move appreciably, if rib bending and continuity of deck are taken into account. It was concluded that these joints should be omitted in design, and that care in the pier design to obtain uniform soil pressure is important.

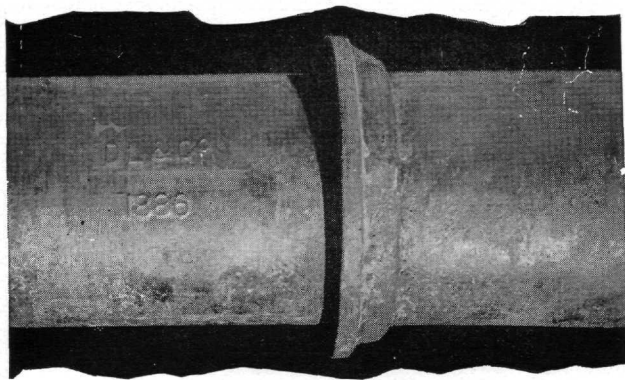
"Problems Concerning Elastic Stability in Structural Engineering" was presented by S. Timoshenko, mechanical engineer of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. This paper discussed the theory of those special conditions in structures where stability rather than stress controls the load carrying capacity. The strength of top chords of pony-truss bridges, of built-up columns, and of webs of columns and plate girders was dealt with.

Results of elaborate studies of the portal type wind bracing in the steel frame work of the forty-eight-story, 555.5 foot, American Insurance Union building in Columbus were given in a paper by A. W. Ross and Professor C. T. Morris of The Ohio State University. Professor Morris, one of the outstanding structural engineers of the country, read the paper, which was entitled, "The Design of Tall Buildings to Resist Wind." Stresses in the lower eight stories were figured exactly by the slope-deflection method. The stresses were also figured by one of the conventional methods called the cantilever method, but this method was shown to produce errors of from 20 to 100 per cent. From their studies the authors developed a set of correction curves for use with the theory for any practical case.

Highway and sanitary engineering also came in for their share of worthwhile papers. George F. Schlesinger, director of the department of highways and public works, State of Ohio, took up highway transport surveys. In 1925, he said, "2,200,000,000 vehicle miles were operated on the 11,000 miles of state highway (out of 84,884 miles of total highway in the state. The outcome of this survey was a five-year improvement program (1927-1931) to cost about \$100,000,000. It includes the widening of 4,800 miles of high type roads less than 18 feet wide."

"Thirty percent of highway accidents," said A. H. Hinkle, maintenance engineer of the Indiana highway department, are due to causes lying in the highway, as against the driver's and the vehicle's shares." Curative, sight distance,

(Continued on Page 22)



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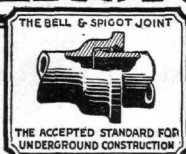
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super-elevation, widening on curves, grades, and crown were taken up in his paper, "The Engineer's Part in Making the Highway Safe."

E. G. Bradbury, county sanitary engineer, Franklin County, Ohio, read a paper on "Sewer and Water Works Construction Under the County Sewer District Law of Ohio and the Assessment of Cost in Proportion to Benefits," while William D. Hatfield, Decatur, Ill., and Samuel A. Greely, Chicago, discussed "The Sewage Disposal Works of Decatur, Ill."

Major-General Edgar Jadwin opened the discussion of the Mississippi River flood problem with a brief review of the present situation. He was followed by Colonel C. McD. Townsend with a "Resumé of the Mississippi River Problem," and by H. C. Frankenfield of the U. S. weather bureau, Washington, D. C., who spoke on "Rain-fall Characteristics of the Mississippi Drainage Basin."

Secretary of War Davis was the principal speaker at the dinner on Wednesday evening. In commenting on the situation he said in part:

"The Mississippi River flood problem is the most important problem before the War Department today. The disaster of 1927 must not be repeated. The present levee line is designed to protect against the largest flood experienced in the 150 years prior to 1927. The plan for the future must be sound in its engineering and in its ordinated whole and carried to completion as rapidly as practicable. The people of the delta section get water from a total of 31 states and two Canadian provinces. They cannot cope with the problem themselves. It is national. The federal government must bear most, if not all of the expense. The protection of 30,000 square miles of rich farming lands justifies a large expenditure. Over 150 engineers of the War Department, 30 engineer officers, and 120 civilians are now working on the problem."

On Thursday several specific recommendations were presented. These included, "Auxiliary Channels or By-Passes as a Means of Flood Control," by M. G. Barnes, chief engineer of the division of waterways of Illinois, and a paper on "Relief Outlets and By-Passes," by C. E. Grunsky, past president of the society.

A great surprise came in the paper on "Reservoirs," by Arthur E. Morgan, vice-president of the society, and president of Antioch College, in which he criticized the Mississippi River Commission and commented on:

- (1) Defective estimates of cost.
- (2) Errors in estimating the amount of work still to be done in completing the levees.
- (3) Complete failure to obtain data on reservoir possibilities or flood contingencies.

In closing he said, "I am convinced that the examination necessary to determine the possibilities of using reservoirs never has been made. I strongly believe that for the national congress to be committed to a permanent policy with reference to flood control on the Mississippi, without such inquiry, will be a mistake of historic magnitude."

The Old Spinster—"Has the canary had its bath yet?"

The Maid—"Yes, he has, mum. You can come in now."